VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Specification

Please replace pending paragraph three of page sixteen with the following amended paragraph:

In Figure 6 the actuator 406 has been placed within the projectile 500. It can be seen in this Figure how the tapered side 408 of the [frusta] frustro-conical section mated against the tapered wall 506 of the hull 502. Similarly, the circular flange 404 of the actuator 406 is shown locked into the circular channel 504. The projectile 500 is illustrated fully assembled in Figure 7 wherein the core particles 520 have been sealed within the hull 502 by the actuator 406. The actuator 406 has a cap 504 that has a diameter equal to that of the hull 502 thereby causing the cap 504 to rest on the rim of the cylindrical portion of the open end of the hull 502. This overlap serves to prevent the actuator 406 from angling or shifting during insertion. The cap 504 further prevents the actuator 406 from sinking into the hull 502 and bringing the stem 408 beyond the functional depth.

Please replace pending paragraph three on page eighteen for the following amended paragraph:

To control the transformation the hull is torn away from the particles at a predetermined rate, thus producing a predetermined rate of expansion of the path that the particles follow subsequent to the initial impact of the projectile with an object. The controlled separation of the particles from the hull can be achieved by peeling the hull back upon itself as a result of the contact of the hull with an object having a predetermined density. The peel back rate of the hull must be controlled so as to release the particles within, preferably, about from .0005 to [.0001]

.001 seconds. This would occur upon penetration of a typical residential partition wall, wooden wall or car windshield.

Please replace pending paragraph three on page twenty-nine with the following amended paragraph:

In Figure [25] 27 an alternate embodiment uses a bonding agent to maintain the core particles 2600 in a consolidated cylindrical form. The conventional crush section 2602 serves as a base unit while the actuator 2604 serves as a top portion. The actuator 2604 works in the same way as previously described. Upon initial impact the bonding agent holding the core particles in a cohesive form shatters, thereby releasing the core particles 2600 to follow the actuator 2604 as described herein. Alternatively the actuator can be eliminated and the core particles bonded into a cylindrical unit affixed to the crush section. As stated above, upon impact the bonding agent would shatter, releasing the core particles. This embodiment would not have the control of expansion after impact provided by the foregoing embodiments incorporating the actuator, however in specific applications this embodiment could provide advantages.

In the Claims

Please delete Claims 4-38.

Please add the following claims:

39. The method of impacting a target with a projectile, said projectile comprising an absorption zone, a hull, a mass of core particles within said hull and an actuator, said actuator being releasably fixed to an impact end of said hull and said absorption zone being upstream of said core particles, comprising the steps of:

a- igniting an explosive charge to project said projectile,

b- absorbing said explosive charge impact within said absorption zone,

c- maintaining said core particles within said hull until a first impact,

d- releasing said actuator and said mass of core particles during said first impact,

e.- maintaining said mass of core particles as a lethal unitary mass, behind said actuator, for a predetermined distance after said first impact,

f- maintaining said actuator on a substantially straight trajectory for said predetermined distance,

g- radially dispersing said mass of lethal unitary mass to produce a mass of non-lethal individual particles.

40. The method of claim 39, wherein the hull peels back away from said mass of core particles at a rate substantially equal to that of the velocity of the projectile thereby maintaining substantially all of said unitary mass in a confined mass behind said actuator and providing a controlled distance of lethality beyond said initial impact.

41. The method of claim 39, wherein a secondary impact of said lethal unitary mass with a target is preceded by a shock wave.

42. The method of claim 39, further comprising the step of maintaining said lethal unitary mass, for said predetermined distance, beyond said first impact with a lethal impact effect substantially equivalent to that of a unitary projectile.

43. The method of claim 39, wherein said actuator is configured such that said predetermined distance is up to about six feet beyond said first impact.

44. The method of claim 39, wherein said actuator is configured such that said predetermined distance is up to about three feet beyond said first impact.

45. A method of controlling the release of energy from a fired projectile, comprising the steps of:

a- releasing from said projectile, during initial impact, an actuator leading a unified, cohesive structure of individual particles,

b- maintaining said individual particles in said unified, cohesive structure behind said actuator for a first predetermined distance,

c- expanding said unified, cohesive structure into a increasingly less unified structure over a second predetermined distance,

d- radially dispersing said structure, after said second predetermined distance, into discrete non-lethal particles.

46- The method of claim 45 further comprising the step of said mass of unified, cohesive structure functioning as a slug in step (b); acting like a slug of substantially increased diameter in step (c); and dispersing into non-lethal discrete particles in step (d).

47- The method of claim 45, further comprising the step of step (c) occurring at a distance of about three feet and within ten feet from said initial impact.

48. The method of claim 45 further comprising the steps of:

a- confining said particles in a hull,

b- peeling back and away said hull from said particles, during said first impact, at a predetermined peel back rate,

wherein said predetermined peel back rate produces a controlled rate of release of said particles immediately subsequent to said initial impact.

49. The method of claim 48 wherein said predetermined peel back rate is substantially equal to the velocity of said projectile.

50. The method of claim 48, wherein said hull is configured to peel back and release said unified, cohesive structure of individual particles on the order of about one ten thousandth of a second.

51. The method of impacting a target with a projectile having a plurality of small particles encased in a hull, comprising the steps of:

a) separating said hull from said plurality of small particles during an initial impact,

b) maintaining said plurality of small particles in the form of a cohesive lethal mass of particles for a distance of at least about two feet beyond the point of said initial impact,

c) dispersing said cohesive lethal mass of particles after said distance into individual non-lethal, radially dispersing particles.

52. The method of claim 51, further comprising the step of initially maintaining said plurality of small particles in the form of a cohesive lethal mass to provide said plurality of small particles with a lethal impact effect substantially equivalent to that of a unitary projectile.

53. The method of claim 51, further comprising the step of said particles dispersing and acting as discrete individual non-lethal particles after traveling no greater than about ten feet beyond said point of initial impact.

54. The method of claim 51, further comprising the step of said particles dispersing and acting as discrete individual non-lethal particles after traveling no greater than about six feet beyond said point of initial impact.

55. The method of claim 51, further comprising the step of said particles dispersing and acting as discrete individual non-lethal particles after traveling no greater than about three feet from said point of initial impact.

56. The method of claim 51, further comprising the step maintaining said small particles in said cohesive mass behind an actuator, said actuator having an exterior side and an interior side and being releasably fixed to said hull is open end to close said hull open end, said initial impact releasing said actuator from said hull is open end.

57. The method of claim 56, wherein actuator periphery is provided with tapered sides, said tapered sides having its greatest radial dimension at said exterior side.

58. The method of claim 56, wherein actuator has at least one stem member, said at least one stem member being centrally positioned and extending from said interior side of said actuator into said cohesive mass.

59. The method of claim 57, further comprising the step of affixing said actuator to said hull open end with a circular ring on said interior side of said truncated conical section of said actuator.

60. The method of impacting a target located beyond a first impact zone, with a projectile, said projectile comprising a gas, wad zone, a hull, a mass of core particles within said hull and a

radial dispersion control member, said radial dispersion control member being releasably fixed to said hull at an impact end and said absorption zone being upstream of said core particles, comprising the steps of:

a- firing said projectile at a target positioned beyond a first impact zone,

b- impacting said first impact zone with said projectile,

c- peeling said hull back upon itself during said impact, and

d- releasing said radial dispersion control member and said mass of core particles

e- generating a pressure wave in advance of said mass of core particles,

f- said radial dispersion control member maintaining said core particles in a unified mass, and having an impact effect substantially equivalent to that of a unitary projectile, for a first predetermined controlled distance, thereafter dispersing said projectile core particles in a progressively expanding pattern such that the particles no longer act as a unitary projectile and travel as substantially discrete individual particles,

wherein impact with a target within said first predetermined distance is equivalent to a lethal unitary projectile and impact beyond said first predetermined distance is a non lethal plurality of individual impacts.

61. The method of claim 60, wherein said core particles substantially start passing said radial dispersion control member after traveling at least about six feet from impact of said target.

62. The method of claim 60, wherein said radial dispersion control member has a stem member, said stem member being surrounded and controlled by said mass of projectile core particles, said mass of projectile core particles being maintained in a substantially unified mass.

REMARKS

Claims 4-37 have been rejected under 35 U.S.C. 112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter. Claims 4 - 37 have been deleted and new claims 39 - 62 are currently pending and it is respectfully submitted that the indefiniteness has been corrected.

Original Claims 21 - 23, 27, 32, 33, 35 and 36 have been rejected under 35 U.S.C. 102(e) as being anticipated by Davies. The Examiner has stated that the Davies patent discloses in Figures 8A - 8C a projectile having a plurality of particles and an actuator. The Davies patent is a standard shotgun shotcup that has been slit to form petals to facilitate disintegration upon impact. According to the description in Col 13, the shotshell payload 90 has an end cap 94 (84 in the drawings) that maintains a quantity of shot 92 enclosed within the body 82. What this produces is no more than a container of shot that disintegrates upon impact. The end cap merely maintains the shot within the body until it reaches an impact point. The Davies patent does not teach any other use of the end cap 94 other than maintaining the quantity of shoe 92 within the projectile prior to and during flight.

Conversely, in the present invention, the projectile the actuator serves a dual purpose of maintaining the particles within the hull prior to initial impact and enabling the particles to continue to travel as a controlled unitary lethal mass for a predetermined distance beyond an initial impact. This can be accomplished by the hull peeling back at a rate inverse to the rate of forward travel upon contact with the initial barrier. This rate of peel back minimizes any disruption of the core particles and the actuator and core particles continue traveling as a unitary mass. The rewritten claims clearly point out that the particles travel as a unitary mass for a predetermined distance beyond an initial impact.

In the Davies patent, the outer shell and payload disintegrates upon impact with the particles dispersing quickly in an uncontrolled manner. As stated in Col 13, lines 52-61, and Figure 8C, the payload refers to the entire projectile - shell, cap and pellets. Davies does not teach that the projectile, or any portion of the projectile, continues on after impact with any lethality beyond the primary impact, nor does Davies teach any method of achieving such a result. Conversely, in the pending application, the hull is a primary lethal vehicle that enables the particles to reach an initial barrier, and to proceed beyond the initial impact as a unified unit, acting as a secondary lethal mass, independent of the hull. This secondary mass can reach a target as a lethal mass, within a predetermined distance beyond an initial impact, such as a driver behind a car windshield. None of the prior art systems have the ability to maintain lethality for only a predetermined distance beyond the initial impact.

With respect to the Davies projectile becoming progressively less lethal over distance after an impact, this is inherent to any projectile. The distinction between the disclosed projectile and the prior art is that the instant projectile goes through step wise transitions becoming non-lethal in a controlled, timed sequence of steps as a matter of design. In the prior art systems, the particles do not continue to travel as a unitary mass for a predetermined distance. The transition in the prior art is: (1) impact, and (2) transition to non-lethal. In the present invention the transition is: (1) impact – (2) continue as unitary lethal mass and after predetermined distance, (3) transition to non-lethal mass. Step (2) is not present in the prior art; rather the prior art systems go directly from (1) to (3). It is the addition of step two that produces a system in which there can be two separate lethal impacts.

Claims 21-23, 27, 32, 33, 35 and 36 are rejected under 35 U.S.C. 102(b) as being anticipated by Canon. The Canon projectile disintegrates immediately upon impact within the

target body and does not teach passing through a barrier, or initial target, and having a lethality range for a predetermined distance beyond the initial impact. As stated at Col 4, lines 6 - 16, the liquid and particles contained within the projectile will be distributed within the target body upon impact. The tip,however, will not necessarily be stopped by the target, especially when lead is used. (Col. 3, lines 55 - Col 4, lines 1- 5)

In the instant application, the projectile can pass through an initial barrier and still remain lethal for a predetermined distance. It is only in a viscous environment that the instant projectile will immediately lose its momentum, at which point the entire projectile is stopped, including the actuator. The Canon patent has no teaching regarding the projectile impacting an initial target or barrier and then maintaining lethality for a predetermined distance beyond this initial impact. Additionally, the Canon patent teaches the use of a projectile having variable sections, one of which includes a heavy liquid to semi-solid gelatinous filler. (Col 5, lines 3-5)

In pending claim 40 and 47-69, the hull peels back or separates during impact with an initial barrier, or target, leaving the particles and actuator to proceed as a unitary mass for a controlled predetermined distance. Since the Canon patent teaches the use of the gel or heavy liquid that would impede or negate the foregoing there would be no motivation to modify the Canon projectile to provide the benefits of the pending projectile.

Claims 24-26, 34 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Davies. The Examiner has stated that it would be obvious to vary the characteristics of the elements of the Davies patent to achieve the desired dispersion of the particles. As stated heretofore, the Davies patent does not teach the controllable continuation of the particles beyond an initial impact as a lethal unit. Further, since the Davies teaches that the projectile disintegrates upon impact, there would be no teaching or desire to create a secondary lethal

impact beyond an initial barrier. The continuation would be in direct opposition to the Davies teachings.

Claims 4, 5 and 7-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Davies in view of Peddie. Since, as stated heretofore, the Davies projectile does not perform in the same manner as the projectile of the instant application and the addition of wad adsorption would not alter the Davies performance to duplicate that of the instant projectile.

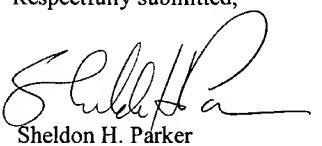
Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Davies in view of Davis. The Davis top wad 32 is placed in the muzzle loader shell and then covered over with a removable cap. The wad of the Davis invention has no specific purpose other than to maintain the pellets within the slit hull until firing whereupon it falls away from the pellets after exiting the firearm. To combine the Davis patent with the Davies projectile still does not produce the pending projectile. There are no teachings in either the Davies or the Davis patents for the hull to peel during impact with a barrier, for the particles to continue as a lethal mass for a predetermined distance and then dissipate into non-lethal individual particles. Adding a wad to the Davies projectile will not produce that result, nor are there any teachings to indicate that this would be a desired, or even thought of, end.

Claims 24-26, 34 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Canon. The Canon device would physically be unable to work in the same manner and the instant projectile, in part due to the liquid and in part due to the difference in designs. It is submitted that no matter what changes one made to the elements of the Canon projectile, it would not produce the same results as the pending projectile and that there are no teachings within the Canon patent that would anticipate the instant projectile.

Claims 4, 5 and 7-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Canon in view of either Turco et al or Knoster, Jr. Applicant does not deny that it is old to use a wad adsorption zone and a gas seal on a projectile. However, as stated heretofore, even with the addition of the devices of either Turco et al or Knoster, Jr., the Canon projectile cannot be modified to produce the results of the instant projectile.

In view of the foregoing amended claims and Remarks, it is respectfully submitted that the claims are in condition for allowance and an early Notice of Allowance is respectfully requested.

Respectfully submitted,



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